What is claimed is:

1. A method of remote digital key generation, comprising:

selecting an initialization code;

sending the initialization code to a first chaotic system;

allowing the first chaotic system to generate an unpredictable first key bitstream;

sending the initialization code to a remote second chaotic system, identical to the first chaotic system, thereby driving the second chaotic system into synchrony with the first chaotic system; and

allowing the second chaotic system to generate a second key bistream which is identical to the first key bitstream because the chaotic systems have been synchronized.

2. The method for remote digital key generation of claim 1 wherein the first chaotic system is defined by a set of differential equations.

3. The method for remote digital key generation of claim 1 wherein the first chaotic system is defined by a mapping function.

4. The method for remote digital key generation of claim 1 wherein the first chaotic system is defined by an electrical circuit.

5. The method for remote digital key generation of claim 1 wherein the first chaotic system is defined by a configuration of optical devices.

6. A system for remote digital key generation, said key generation system comprising:

means for selecting an intialization code;

means for sending the initialization code to a first chaotic system;

means for allowing the first chaotic system to generate an unpredictable first key bitstream;

means for sending the initialization code to a remote second chaotic system, identical to the first chaotic system, thereby driving the second chaotic system into synchrony with the first chaotic system; and

means for allowing the second chaotic system to generate a second key bitstream, which is identical to the first key bitstream because the chaotic systems have been synchronized.

7. The system for remote digital key generation of claim 6 wherein the first chaotic system is defined by a set of differential equations.

8. The system for remote digital key generation of claim 6 wherein the first chaotic system is defined by a mapping function.

9. The system for remote digital key generation of claim 6 wherein the first chaotic system is defined by an electrical circuit.

10. The system for remote digital key generation of claim 6 wherein the first chaotic system is defined by a configuration of optical devices.

11. A system for remote digital key generation, said key generation system comprising:

an encryptor for sending an initialization code to a first chaotic system, allowing the first chaotic system to generate an unpredictable first key bitstream, and for sending the initialization code to a decryptor; and

the decryptor for sending the initialization code to a remote second chaotic system, identical to the first chaotic system, thereby driving the second chaotic system into synchrony with the first chaotic system and allowing the second chaotic system to generate a second key bitstream, which is identical to the first key bitstream because the chaotic systems have been synchronized.